CLAIM + DETAILED DESCRIPTION

[Claim(s)]

[Claim 1] The resin constituent which adds an ethylene-vinyl acetate copolymer saponification thing, and is characterized by things after carrying out fusion mixture of polyamide system resin and the alcoholic system compound.

[Claim 2] The resin constituent according to claim 1 characterized by polyamide system resin being amorphous nylon and/or fatty series nylon.

[Claim 3] The resin constituent according to claim 1 or 2 characterized by an alcoholic system compound being polyhydric alcohol.

[Claim 4] one of the Claims 1-3 characterized by the melting temperature at the time of fusion mixture of polyamide system resin and an alcoholic system compound being 100-280 degrees C -- the resin constituent of a description.

[Claim 5] one of the Claims 1-4 characterized by the fusion mixture bulk densities of polyamide system resin and an alcoholic system compound being 99 / 1 - 60/40 -- the resin constituent of a description.

[Claim 6] one of the Claims 1-5 characterized by the combination bulk densities of polyamide system resin, the fusion mixture of an alcoholic system compound, and an ethylene-vinyl acetate copolymer saponification thing being 4 / 96 - 40/60 -- the resin constituent of a description.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the resin constituent which was excellent in transparency or retort-proof nature in more detail about the resin constituent which consists of polyamide system resin and an ethylene-vinyl acetate copolymer saponification thing (it is

hereafter written as EVOH).

[0002]

[Description of the Prior Art] Conventionally, EVOH is used abundantly as various kinds of films for packing including food taking advantage of the gas barrier nature and transparency. On the other hand, since EVOH is hydrophilicity, it also has a fault, like the permeability of moisture lacks in heat-resistant water greatly, and shock resistance is also missing by stiffness. Improvement in the fabrication nature of EVOH is made into a means at the same time it improves these faults. many things for which polyamide system resin is blended with EVOH are tried conventionally (JP,S44-24277,B --) JP,S48-22833,B, JP,S50-121347,A, JP,S60-24813,B, JP,S60-24814,B, JP,S64-9238,A, JP,H4-76039,A, JP,H5-1819,B, etc.

[0003]

[Problem(s) to be Solved by the Invention] However, only by carrying out fusion mixture in carrying out fusion mixture of EVOH and the polyamide system resin When a certain kind of polyamide system resin is used [the transparency of the resin constituent of EVOH obtained since both compatibility was bad, and polyamide system resin falls, or] Be [going to desire / just / moreover, / there is also a possibility that physical properties, such as retort-proof nature when the fabrication nature when fabricating on a film etc. falling, or using for the packing use of food further, may fall, and / these / a resin constituent of anxious good EVOH which is not, and polyamide system resin]

[0004]

[Means for Solving the Problem] Then, in order to solve this problem, as a result of this invention person's repeating research wholeheartedly, after doing fusion mixture of polyamide system resin and the alcoholic system compound, the resin constituent which adds EVOH finds out that the above-mentioned technical problem is solvable, and he came to complete this invention.

[0005]

[Embodiment of the Invention] This invention is explained concretely hereafter. As polyamide system resin used for this invention Polycapramide (nylon 6), Polly omega-amino heptanoic acid (nylon 7), Polly omega-amino nonanoic acid (nylon 9), the poly UNDE can amide (Nylon 11), Poly lauryl RAKUTAMU (Nylon 12), polyethylene range amine adipamide (nylon 2 and 6), Polytetra ethylene adipamide (nylon 4 and 6), polyhexamethylene adipamide (nylon 6 and 6), Polyhexamethylene SEBAKAMIDO (nylon 6 and 10), polyhexamethylene DODEKAMIDO (nylon 6 and 12), Poly octa methylene adipamide (nylon 8 and 6), PORIDEKA methylene adipamide (nylon 10 and 8), Caprolactam / lauryl RAKUTAMU copolymer (nylon 6/12), Caprolactam / omega-amino nonanoic acid copolymer (nylon 6/9), Caprolactam / HEKISA methylene dianmonium AJIPETO copolymer (nylon 6/6, 6), Lauryl RAKUTAMU / HEKISA methylene dianmonium AJIPETO copolymer (Nylon 12/6, 6), ethylene diamine adipamide /

HEKISA methylene dianmonium AJIPETO copolymer (nylon 2) 6/6, 6, caprolactam / HEKISA methylene dianmonium AJIPETO / HEKISA methylene dianmonium sebacate copolymer (nylon 6, 6/6, 10), Ethylene ammonium horse mackerel PETO / HEKISA methylene dianmonium AJIPETO / HEKISA methylene dianmonium sebacate copolymer (nylon 6/6, 6/6, 10), Polyhexamethyleneisophthalamide, polyhexamethylene terephthalamide, HEKISA methylene isophthalamide / terephthalamide copolymers, or these polyamide system resin Methylene benzoRUAMIN, A thing, METAKISHIRI range ammonium AJIPETO, etc. which denatured by aromatic amine, such as METAKISHI range amine, are mentioned. These one sort or two sorts or more are used, and also in these further Amorphous nylon, such as HEKISA methylene isophthalamide / terephthalamide copolymer, and caprolactam / HEKISA methylene dianmonium AJIPETO copolymer (nylon 6/6, 6), Fatty series nylon, such as poly lauryl RAKUTAMU (Nylon 12), is used suitably.

[0006] moreover, [the above-mentioned polyamide system resin] as an alcoholic system compound by which fusion mixture is carried out If it has an alcoholic OH basis, it will not be limited in particular but specifically Ethyl alcohol, Methyl alcohol, propyl alcohol, isopropyl alcohol, Butyl alcohol, isobutyl alcohol, sec-butyl alcohol, tert-butyl alcohol, n-amyl alcohol, isoamyl alcohol, Hexyl alcohol, HEPUCHIRU alcohol, octyl alcohol, capryl lactam alcohol, Nonyl alcohol, decyl alcohol, UNDESHIRU alcohol, lauryl alcohol, Tridecyl alcohol, milli still alcohol, pentadecyl alcohol, Cetyl alcohol, heptadecyl alcohol, stearyl alcohol, Nano decyl alcohol, eicosyl alcohol, SERIRU alcohol, MERISHIRU alcohol, allyl alcohol, KUROCHIRU alcohol, propargyl alcohol, Univalent alcohol, such as cyclo pen tongue alcohol, cyclo HEKISAN alcohol, benzyl alcohol, a thinner MIRUARU call, furfuryl alcohol, and fatty acid monoglyceride, a glycol, diethylene glycol, a bird glycol, All [polyethylene-glycols, 1, and 2-pro pansy], 1, all [3-pro pansy], 1, 2-butanediol, 1, 3-butanediol, 2, 3-butanediol, 1, 4-butanediol, 1,5-pentanediol, 1, 5-hexandiol, 1, 6-hexandiol, neopentyl glycol, 1 and 2, 6-HEKISAN triol, 1, 3, 5-HEKISAN triol, bird MECHIRU propane, a GURISE roll, Gigli serine, sorbitol, stearic acid PENTA erythritol, Adipic acid PENTA erythritol, pylori boss carboxylic acid dipentaerythritol, Alcoholic system compounds, such as polyhydric alcohol, such as glutamic-acid dipentaerythritol and maleic anhydride denaturation wood rosin PENTA erythritol, and polyvinyl alcohol system resin of further a low degree of polymerization, can be mentioned. Polyhydric alcohol, such as diethylene glycol, a bird glycol, 1, 3-butanediol, 2, 3-butanediol, 1, 4-butanediol, 1 and 2, 6-HEKISAN triol, 1 and 3, 5-HEKISAN triol, a GURISE roll, and sorbitol, is used suitably.

[0007] furthermore, as EVOH blended with the fusion mixture of the above-mentioned polyamide system resin and an alcoholic system compound Although not limited in particular, [less than ethylene content 60 mol % (further 20-55mol %)] It worsens [gas barrier nature falls, and / less than / 90 mol % /, gas barrier nature falls / the degree of saponification /, or /

heat stability] and is not desirable, if the thing beyond 90 mol % (95 moremol % more than) is used for the degree of saponification of an acetic acid vinyl ingredient and an ethylene content exceeds 60mol %.

[0008] Moreover, propylene of further a small quantity [EVOH / this], iso BUTEN, alpha-OKUTEN, It does not interfere, even if KOMONOMA, such as alpha olefins, such as alpha-dodecen and alpha-octadecene, unsaturated carboxylic acid or its salt, partial ARUKIRU ester, perfect ARUKIRU ester nitril amide and anhydride, unsaturated sulfonic acid, or its salt, is included. Moreover, as for the melt index (MI) of EVOH, 0.5 - 10 50g / minutes (210 degrees C, 2160g load) are desirable, and further 1 - its 10 35g / minutes (same as the above) are desirable. If viscosity becomes high too much in under 0.5g / 10 minutes (same as the above) in this MI, fusion extrusion becomes impossible and 50g / 10 minutes (same as the above) are exceeded conversely, film production nature falls and is not desirable.

[0009] In this invention, in mixing polyamide system resin to EVOH, it is characterized [greatest] by carrying out fusion mixture of the alcoholic system compound beforehand, and this fusion mixture is explained to this polyamide system resin. fusion of polyamide system resin and an alcoholic system compound -- the mixture ratio -- [a rate] Although not limited in particular, 99 / 1 - 60/40 usually have the desirable bulk density of polyamide system resin / alcoholic system compound. Furthermore, if this bulk density exceeds 99/1, since the compatibility improvement with EVOH is inadequate, it becomes difficult and is not desirable [98 / 2 - 55/45 are desirable, and / causing the poor appearance of a film, and it being conversely stabilized in less than 60/40, and Strand-izing a resin constituent]. As for this fusion mixture, it is desirable to carry out at 100-280 degrees C, and it is further 125-275 degrees C, and if the fusion nature and extrusion-molding nature of polyamide system resin fall at less than 100 degrees C and this temperature exceeds 280 degrees C conversely, it is [a possibility that an alcoholic system compound may evaporate] and is not desirable. Although not limited especially as the method of fusion mixture, extrusion machines, such as a single axis extrusion machine and a biaxial extrusion machine, can usually be used.

[0010] The resin constituent of this invention is obtained by being able to obtain the fusion mixture of polyamide system resin and an alcoholic system compound, and subsequently to EVOH blending this fusion mixture by the above-mentioned method. Although the combination bulk density in particular of this fusion mixture and EVOH is not limited, usually 4 / 96 - 40/60 have the desirable bulk density of a fusion mixture / EVOH, and if being discovered of this bulk density of retort-proof nature becomes inadequate [less than 4/96] and it exceeds 40/60 conversely, gas barrier nature falls and is not desirable. Moreover, mixture of a fusion mixture and EVOH is also desirable and considering it as fusion mixture [the melting temperature at this time] 150-250 degrees C is desirable, and this temperature at further 155-245 degrees C [less than 150 degrees C] If fusion mixture nature falls and 250 degrees C is exceeded

conversely, EVOH deteriorates, or the reaction of EVOH and polyamide system resin is promoted, preferably, it is not limited in particular as the method of fusion mixture, but extrusion machines, such as a single axis extrusion machine and a biaxial extrusion machine, can be used like the above.

[0011] Furthermore, in this invention [EVOH or polyamide system resin, and the resin constituent of this invention further obtained from these and an alcoholic system compound] It is also possible to add an antioxidant, lubricant, an ultraviolet ray absorbent, fire retardant, colorant, an antiblocking agent, a spray for preventing static electricity, a filler, etc., and metal (alkaline metal, alkaline-earth-metals, transition metal, etc.) salt may be contained, and boron, silica, etc. may be contained further. the resin constituent of obtained this invention being fabricated by a film, the sheet, etc. in this way, and being extended by further 1 axis or two axes -- not only a monolayer but this film and sheet -- at least -- much more -- ** -- using as a layered product to carry out is also useful, and this layered product is explained further.

[0012] In manufacture of this layered product, you may laminate (dry) or a layered product may be manufactured with a multilayer extrusion machine. [when manufacturing a layered product by lamination, laminate other base materials to one side or both sides of molded products (a film, a sheet, etc.) of this invention, but] For example, the method of laminating this resin molded product, and the film of other base materials and a sheet, using well-known adhesives, such as an organic titanium compound, an iso cyanate compound, and a polyester system compound, as the lamination method etc. is mentioned.

[0013] As other base material films to apply, straight chain-like low density polyethylene, low density polyethylene, Inside density polyethylene, high-density polyethylene, EVA, eye ONOMA, An ethylene propylene copolymer, an ethylene acrylic ester copolymer, Polypropylene, a propylene alpha olefin (alpha olefin of carbon numbers 4-20) copolymer, Polyolefin system resin of wide senses, such as independent or a copolymer, or independent or a thing which carried out graft denaturation of the copolymer with unsaturated carboxylic acid or its ester of these OREFIN of OREFIN, such as poly BUTEN and Pori Penn Teng, Polystyrene system resin, polyester, polyamide, copolymerization polyamide, Polyvinyl chloride, a polyvinylidene chloride, acrylic resin, vinylester resin, A polyester elastomer, a polyurethane elastomer, chlorinated polyethylene, chlorination polypropylene, EVOH, etc. are mentioned, and paper, metallic foil, one axis, a biaxial extension plastic film or a sheet, textiles, a nonwoven fabric, metal ****, a woody side, etc. are still more nearly usable. When setting I (I1, I2, ...) and other base materials, for example, a thermoplastics layer, to II (II1, II2, ...) for the layer of the molded product (film) of this invention as layer composition of a layered product, If it has a film and the shape of a sheet, not only the two-layer structure of I/II but arbitrary combination, such as II/I/II, I/II/I, I2 [I1/]/II, I/II1/II2, and II2/II1/I/II1/II2, is possible.

[0014] The resin constituent of this invention is excellent in transparency, and it excels in the

fabrication nature when fabricating on a film etc. further. And this film is excellent in retort-proof nature etc., and is very useful for the use of food, medical supplies, an agricultural-chemicals article, the film for industrial-chemicals packing, a sheet, a tube, a bag, a container, etc., and its practicality is especially high as an object for retort sterilization for food packing.

[0015]

[Example] Hereafter, a work example is given and this invention is explained concretely. In addition, among an example, especially, that it is with a "part" and "%" means a weight standard, as long as there is no notice.

85 copies of work-example 1 amorphous nylon (the Mitsubishi Chemical make, "Novamid X21") and 15 copies of sorbitol were supplied to the 2 axis extrusion machine, fusion mixture was performed at 250 degrees C (barrel temperature), and the fusion mixture was obtained. Subsequently, ten copies of obtained fusion mixtures and EVOH[degree %of 99.8mol of 30mol of ethylene content % and saponification] 90 copy were supplied to the 2 axis extrusion machine, fusion mixture was performed at 235 degrees C (barrel temperature), and the resin constituent of this invention was obtained. The following evaluations were performed using the obtained resin constituent.

(Transparency) This resin constituent was supplied to the single axis extrusion machine equipped with T Di, the 30-micrometer-thick film was fabricated, the Hayes value of the film obtained 100 hours afterward was measured, and it evaluated as follows.

O --- The Hayes value is less than [10] x. --- In addition, the Hayes value carried out the film production conditions by a single axis extrusion machine as follows ten or more.

Screw inside diameter 40mm L/D28 Screw compression ratio 3.8 T DAIKOTO hanger type Di 450mm in width Extrusion temperature C1:210 degree C H:230 degrees C C2:220 degree C D:220 degrees C C3:230 degree C C4:230 degree C [0016] (Fabrication nature) In the above-mentioned monolayer fusion fabrication, visual observation was carried out and the generating situation of the gel on the surface of a film when performing prolonged fabrication of 100 hours was evaluated as follows.

O --- Generating of gel is less than [ten piece //m / 2] x. --- Generating of gel is ten or more pieces/m2. [0017] (Retort-proof nature) The obtained film (non-oriented film) was neglected for room temperature 30 minutes after retorting for 30 minutes at 120 degrees C, visual observation was carried out and the appearance of this film was evaluated as follows.

O --- It was transparent and discoloration was not accepted.

x --- Hayes -- or chlorosis was carried out and discoloration or DERAMI was accepted.

[0018] In work-example 2 work example 1, except having obtained the fusion mixture using 95 copies of amorphous nylon (the Mitsubishi Chemical make, "Novamid X21"), and five copies of 2 and 3-butanediol, the resin constituent was manufactured similarly and it evaluated similarly.

[0019] In work-example 3 work example 1, except having obtained the fusion mixture using 70

copies of fatty series nylon (the Mitsubishi Chemical make, "Novamid 2030"), and 30 copies of 2 and 3-butanediol, the resin constituent was manufactured similarly and it evaluated similarly.

[0020] In work-example 4 work example 1, a fusion mixture is obtained using 75 copies of amorphous nylon (the Mitsubishi Chemical make, "Novamid X21"), and 25 copies of sorbitol, and it is EVOH further, Except having used degree% of EVOH of 99.8mol of 45mol of ethylene content % and saponification, having made the quantity into 80 copies, and having made this fusion mixture into 20 copies, the resin constituent was manufactured similarly and it evaluated similarly.

[0021] In work-example 5 work example 3, except having obtained the fusion mixture using 80 copies of fatty series nylon (the Mitsubishi Chemical make, "Novamid 2030"), and 20 copies of GURISE rolls, having made EVOH into 70 copies further, and having made this fusion mixture into 30 copies, the resin constituent was manufactured similarly and it evaluated similarly.

[0022] In work-example 6 work example 3, except having obtained the fusion mixture using 90 copies of fatty series nylon (the Mitsubishi Chemical make, "Novamid 2030"), and ten copies of sorbitol, the resin constituent was manufactured similarly and it evaluated similarly.

[0023] In work-example 7 work example 1, except having changed the alcoholic system compound into 1, 3, and 5-HEKISAN triol, the resin constituent was manufactured similarly and it evaluated similarly.

[0024] In comparative example 1 work example 1, ten copies of amorphous nylon (the Mitsubishi Chemical make, "Novamid X21") and 90 copies of EVOH(s) were directly supplied to the 2 axis extrusion machine, fusion mixture was performed, without using sorbitol, the resin constituent was manufactured, and it evaluated similarly.

[0025] Carry out the package blend of 99.7 copies of amorphous nylon (the Mitsubishi Chemical make, "Novamid X21"), 0.3 copy of sorbitol, and 90 copies of EVOH(s) in comparative example 2 work example 1. The 2 axis extrusion machine was supplied, fusion mixture was performed at 235 degrees C (barrel temperature), the resin constituent was manufactured, and it evaluated similarly.

[0026] In comparative example 3 work example 1, without using sorbitol, the resin constituent was manufactured similarly and it evaluated similarly. The evaluation result of a work example and a comparative example is shown in Table 1.

[0027]

[Table 1]

	透明性	成形性	耐レトルト性
実施例 1	○	○	○
〃 2	○	○	○
〃 3	○	○	○
〃 4	○	○	○
〃 5	○	○	○
〃 6	○	○	○
〃 7	○	○	○
比較例 1	×	×	×
〃 2	×	△	×
〃 3	○	×	○

[0028]

[Effect of the Invention] Since the resin constituent of this invention is excellent in transparency, homogeneity, retort-proof nature, etc., it is very useful for the use of food, medical supplies, an agricultural-chemicals article, the film for industrial-chemicals packing, a sheet, a tube, a bag, a container, etc., and its practicality is especially high as an object for retort sterilization for food packing.

[Translation done.]